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ABSTRACT

An earlier study found it very difficult to attract large numbers of college-age smokers to a traditional counseling center based smoking cessation program, despite repeated efforts at advertising the availability of a free program. This study utilizes the program from the earlier study but tailors it more specifically to the needs of the target college age population. Weekly one-on-one intensive smoking cessation sessions replaced the original three one-hour sessions over a three-week period. Participants (N=13) were monitored through administration of logs which they maintained tracking their smoking behavior, and with regular telephone calls from the staff involved in the treatment program. The researchers also abandoned the group-administered smoking cessation program in favor of home-based individualized treatment methods to afford increased confidentiality and sustain students' motivation. Participants experienced significant reductions in their smoking, both during the scheduled and reduced phases of the treatment. This type of cessation program appears to be a promising way of addressing the needs of young adult and adult smokers, many of whom are reluctant to participate in large, group-format, counseling center-based programs. Discusses implication for future research. (Contains 2 tables and 34 references.) (MKA)

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# Individualized Attempts to Reduce Cigarette Smoking Among College Students

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1999

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## Abstract

Kane, Hodges, Srebro, Fruhwirth and Chambliss (1999) reported success in using a scheduled smoking treatment approach on a college campus. Due to the difficulty in attracting large numbers of college-age smokers to a traditional counseling center based smoking cessation program, a more convenient and customized way of reaching these smokers was employed. In the current study, the literature on home based models of care was applied to the task of helping young adult and older adult students reduce their smoking. Significant smoking reduction was observed following use of the individualized scheduled smoking program.

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## Introduction

Cigarette smoking remains the largest single preventable cause of death in the United States (Barton, et al., 1982; Compas, et al., 1998; Price, et al., 1998; Wechsler, et al., 1998). It has been estimated that 400,000 premature deaths occur per year in the United States secondary to cigarette smoking (Lewis, et al., 1998). Despite this, roughly one-quarter of the U.S. population smokes (Compas, et al., 1998). Although cigarette consumption among adults in the U.S. has declined, use of cigarettes among the adolescent population has continued to grow (Price, et al., 1998). Since 1993, a disturbing increase in smoking among college students was reported (Wechsler, et al., 1998). Wechsler and his colleagues (1998) noted that there is limited information about the factors shaping this increase in smoking among the college student population.

Kane, Hodges, Srebro, Fruhwirth and Chambliss (1999) reported success in using a scheduled smoking treatment approach on a college campus. However, they found that it was very difficult to attract large numbers of college-age smokers to a traditional counseling center based smoking cessation program, despite repeated efforts at advertising the availability of this free program. Based on the assumption that young smokers are at best ambivalent about modifying their smoking, these researchers recommended the development of more convenient and customized ways of reaching these less highly motivated individuals.

In light of poor attendance at previous group cessation programs, the researchers developed alternative ways of implementing the original program, tailored more specifically to the needs of the target college age population. In order to streamline the counseling center-based program used by Kane, Hodges, Srebro, Fruhwirth and Chambliss (1999) to make it more convenient for busy participants, several modifications were made. Weekly one-on-one intensive smoking cessation sessions replaced the original three one-hour sessions over a three-week period. Participants were tracked through administration of logs they maintained tracking their smoking behavior (similar to those in the first smoking cessation program), and also with regular telephone calls from the staff involved in the treatment program. The researchers also abandoned the group-administered smoking cessation program in favor of home based individualized treatment methods, in order to afford increased confidentiality and sustain students' motivation.

## Individualized Home Based Treatments

The literature on individualized home based preventive treatments supports the use of this type of approach. Meyer and Gibbons (1997) found evidence of a decline in home based health care delivery starting after World War II; for example, house calls at that time were forty percent compared to 0.6 percent in 1980. Despite this trend, several researchers have discussed the

advantages of home based treatment approaches. Campion (1997) noted that home based care spares clients the nuisance and inconvenience of trekking to the area where health care service is provided. Campion (1997) also notes that clients feel more assured in their own home setting than at the point of service treatment setting. Clients feel that those caregivers who participate in home based programs provide greater empathy, increased commitment to the client, enhanced reassurance to the client and reduced perceptions of isolation (Campion, 1997). In addition to these positive outcomes from home based care, programs based on this model allow the evaluator to assess the clients' function and compliance in a "real world setting".

There is a trend favoring heavier reliance upon home based care and prevention programs among those addressing the problem of HIV. Low risk gay men have been found to be more inclined to participate in small group intervention programs than high risk homosexual individuals (Hoff, et al, 1997). Hoff and his colleagues performed an 18-month comparison study evaluating HIV/AIDS prevention programs targeting the gay community. The four programs assessed were outreach, home meetings, safer sex workshops and HIV antibody testing and counseling. Hoff and his colleagues found that outreach programs were able to reach a large proportion of men (59% of 49 participants) at risk. It must be noted that the outreach program took place in gay bars, sex environments and community events that enabled the target group to participate in HIV prevention programs without having to be present at group activities. The second most effective program was the home meeting prevention program (no percentages were given in the article); followed by safe sex (6 % with 12 participants), the HIV testing and counseling sites had few participants attend (again, no percentage were provided).

Further investigations into the efficacy of home based prevention programs involve high-risk perinatal care. Olds and his colleagues (1998) examined home based prevention programs aimed at women with high-risk health related behaviors during pregnancy. These behaviors included cigarette smoking, drinking and substance abuse. The programs were aimed at prevention of poor pregnancy outcomes, the prevention of infant health and developmental problems and improving the mothers' life course. Olds and his colleagues found that specific parental behaviors and social risk factors were potentially alterable and if intervention was available could possibly reduce developmental problems in children of high-risk mothers. In 1977, the researchers began the Elmira trial; ironically, it was the same year that cigarette smoking was identified as a serious threat to the health and development of the fetus. Empirical evidence is showing that preventive home based programs targeting high risk women during pregnancy can improve the outcomes of pregnancy, improve the mother's ability to care for the child and reduce welfare dependence (Olds, et al. 1998).

Olds and his colleagues (1998) reviewed the results of two randomized trials of perinatal and early childhood nurse

visitation programs. The first evaluated was the Elmira study, a longitudinal design and efficacy study which followed the pregnant mothers during pregnancy to the child's 15th birthday. Four hundred participants enrolled in the program, 85% were either low income, unmarried, teenaged and had no previous live birth. The women were randomly assigned to one of four treatment groups.

Families in Treatment 1 (n = 94) were provided with sensory and developmental screening for the child at 12 and 24 months of age, they were then referred for further clinical evaluation and treatment if needed. Treatment 2 (n = 90) were provided with the same services as in Treatment 1, with the addition of free transportation for prenatal and well-child care through the child's second birthday. Treatment 3 (n = 100) were proved the same services as in Treatments 1 and 2 in addition to a nurse who visited them at home during pregnancy. Treatment 4 (n = 116) were provided with the same services as in Treatment 3 with the nurse making home visits up to the child's second birthday.

The findings from the study when comparing the nurse visitation groups to Treatment groups 1 and 2 were the following. Nurse visited women improve their diets to a greater extent, women identified as smokers decreased their cigarette consumption by 25 %, nurse visited women broadened their social support network and had 75% fewer preterm babies when compared to women who received no visiting nurse. Child abuse among the visiting nurse group was documented at 4 % where as the treatment groups without a visiting nurse had levels of child abuse as high as 19%. In addition, those children in the nurse visitation group had less serious levels of neglect and abuse when compared to those groups without a visiting nurse. For cost analysis, families who were in the visiting nurse group cost the government $3,313 less then treatment groups without a visiting nurse.

The second study evaluated by Olds and his Colleagues was the Memphis Trial; the study was performed to test the replication and effectiveness of the Elmira program. Confounds in the Memphis Trial included lack of continuity on behalf of the nurses involved in the study and the lack of involvement of the administration in the program. The trial consisted of 1,139 low-income pregnant women, unmarried, had less then 12 years of education and was unemployed. Eighty-five percent came from households at or below federal poverty guidelines and 10% smoked cigarettes at the time of enrollment. The women were then randomly assigned to the treatment groups similar to those of the Elmira program. The women assigned to the visiting nurse treatment groups were more apt to obtain support from social service networks when compared to treatment groups not receiving nurse home visits. Again noted was that nurse visited children had fewer rates of abuse and neglect and those that had been exposed to such incidence were less threatening when compared to the children not receiving nurse home visits.

It is important to note that for home based preventive treatment to be effective, treatment providers must be well

trained in the area of the target behavior for the program to succeed. Continuity of care from the treatment providers and empathy toward those in treatment also play a significant role in the effectiveness of home based preventive programs (Campion, 1997; Olds, et al., 1998.).

## Factors Promoting College Student Smoking

Barton and his colleagues (1982) found that the factors motivating adolescent smoking are quite different from those motivating their adult counterparts. Barton et al. (1982) argue for the need for different treatment approaches at different age levels within adolescence. Many teenagers make the decision to smoke despite having knowledge that this behavior has long term ill effects (Gibbons, et al, 1998). Stein and her colleagues (1996) found that smoking among adolescents typically fluctuates, especially between early and late adolescence, and that those teens who smoke for peer modeling or experimentation will generally cease smoking as they age.

According to Evans and his colleagues (1977), the smoking benefits perceived by the adolescent outweigh the health risk factors. Adolescents believe that the health risks of smoking are confined to the adult and older population. Early adolescents are motivated to smoke by their concern about peer acceptance (Barton, et al., 1982; Newcomb, et al., 1989; Gibbons, et al., 1998; Erikson, 1963; Stein, 1996; Ouellette & Wood, 1998; Price, et al., 1998). Simmons and his associates (1973) found that early teen smoking is a way to attain an ideal self-image. Since this age period is a time of identification with peer social circles, this age group is motivated to adopt behaviors, such as smoking, to fit in with these social groups and indirectly increase self-esteem. Price and his colleagues (1998) stated that the most important factor in the increase of cigarette use among adolescents remains peer influence and willingness to take risks. Price and his associates also found that experimentation and occasional cigarette use increases the chance of becoming a "regular" smoker.

Erikson (1963) noted that adolescents are "preoccupied with social images and identities- their own and others'." Gibbons and his colleagues (1998) concluded that adolescent smoking was a response to social opportunities that arose, (for example, teenagers at a party with friends who had cigarettes). The researchers found that availability of cigarettes and willingness to smoke could lead to smoking within the adolescent population, even with little or no previous intention to smoke. Ouellette and Wood (1998) in their research support the concept of smoking initiation as a form of peer identification. Ajzen (1991) similarly found that intention to smoke is influenced by an individual's logical reasoning skills, attitudes towards the behavior, social pressure, and the ease of carrying out the behavior.

Newcomb, McCarthy, and Bentler (1989) investigated smoking

involvement, academic lifestyle orientation, emotional well being, social impact efficacy, and peer smoking as a predictor of cigarette use among adolescents. Confirmatory factor analysis revealed that early adolescent smoking involvement was significantly associated with decreased academic lifestyle orientation, decreased emotional well being, increased early adolescent social impact efficacy, increased peer smoking behavior, and increased young adult smoking. Supporting Newcomb and his colleagues' findings was a study by Hu, Lin, and Keeler, (1998). Hu, et al. studied 5,028 teenagers who completed the California Youth Tobacco Survey. The teenagers were then divided into three groups by smoking status: Current smoker, former smoker and nonsmoker. Included in their analysis was age, gender, race, family income and school performance of the respondent. Analysis of the data showed that the older the age of the adolescent, the more likely they were a current smoker and the less likely they would become former smokers. Additionally, students who performed below average were more often current smokers and less likely to have stopped smoking. Also, teenagers from the highest income group ($75,000) showed higher rates of being former smokers. Finally, below average students with lower household incomes were less likely to quit smoking.

Stein, Newcomb, and Bentler (1996) performed a longitudinal study of 133 men and 328 females, who were recruited in junior high school, and assessed personality traits associated with the smoking adolescent population and those who continued to smoke into young adulthood. The researchers found that early adolescent smoking was positively correlated with cheerfulness, more socialization with peers, and extroversion. At reevaluation four years later, cigarette use and depression were positively correlated, and cigarette use was negatively correlated with good social relations and minimally correlated with extroversion. Stein and her colleagues concluded that early smokers initiate smoking for social factors (peer identification) and that those who continue to smoke into adulthood did so for emotional reasons (relief from stress).

## Optimal Smoking Cessation Treatment Strategies

Researchers have repeatedly observed that smoking intervention programs have very modest effects on immediate and long-term abstinence rates (Price, et al., 1998). Smoking cessation programs have positive effects up to the first six months of treatment, but then the rates of relapse start to become manifest (Wilson, et al., 1990; Becona, et al., 1998; Rosal, et al., 1998). After participation in any given smoking cessation program, the rate of relapse at one year following the program varies from sixty to ninety percent (Becona, et al., 1998; Lewis, et al., 1998; Rosal, et al., 1998; Piasecki, et al., 1998; Compas, et al., 1998).

Ouellette and Wood (1998) found that frequency of past behavior directly influenced the strength of habit formation. Once an adolescent has initiated and formed the habit of smoking, addiction to nicotine can be a result. This addiction strongly maintains smoking behavior. Piasecki, et al. (1998) found that withdrawal symptoms have a profound effect on cigarette dependence and relapse when attempting to cease the habit. Withdrawal symptoms associated with smoking cessation include urge/cravings, irritability, difficulty concentrating, anxiety, depression and dysphoria, impatience, sleeping disturbances and hunger. The manifestations of these symptoms are at the highest point during the first week of smoking cessation and abate within one to four weeks; individuals who smoke reported withdrawal symptoms as a major obstacle to abstinence (Cummings, Giovino, Jaen, & Emrich, 1985).

Piasecki, Fiore, and Baker (1998) discovered that those individuals who had an atypical course of nicotine withdrawal, show symptoms that continued or were intensified after the standard withdrawal period, are at high risk for relapse if they begin a smoking cessation program. The researchers also found that onset of withdrawal symptoms was enough to motivate individuals attempting to cease the behavior to begin smoking again.

Barton, Chassin, and Presson (1982) found that the use of long term health hazard education as a form of deterring teenagers from smoking had no significant impact on the adolescent population. Goldman and Glantz (1998) evaluated anti-smoking advertisements and found that youth access, portrayal of short-term effects and long term effects of smoking, and discussion of the possibility of romantic rejection had no impact on the adolescent's intention to smoke. Barton and his colleagues believed that strategies aimed at social image issues that were pertinent to the adolescent population and the influence of these struggles as motivators to smoke need to be addressed. The researchers stated that early adolescents' self-image/identity and group acceptance programs must be addressed in regards to smoking. For middle adolescents, self-image with respect to the opposite sex also needs to be addressed.

Newcomb, McCarthy and Bentler (1989) advocated interventions pertaining to adolescent smoking that aimed at emphasizing the academic lifestyle as a high priority, because during the school years teenagers are more prone to initiate smoking. Supporting Newcomb and his colleagues were Hu, Lin, and Keeler (1998). Their research concluded that developing academic or remedial classes that are targeted at improving a student's school performance may lead to a reduction in smoking rates within the adolescent population.

Compas and his colleagues (1998) evaluated a multicomponent behavior therapy treatment program for smoking cessation produced by Hill, Rigdon, and Johnson (1993). The study consisted of 82 participants randomly assigned to one of four treatment groups. The first group received behavior therapy, which included

information on health risks and benefits of ceasing smoking. Also included in the behavioral therapy were environmental and situational risk factors associated with relapse. The second group received the aforementioned behavioral therapy and also nicotine gum. The third group received the behavioral therapy and physical therapy. The fourth group received only physical therapy. The end result revealed that all participants assigned to behavioral therapy had an overall thirty-two percent abstinence rate. The participants who did not have behavioral therapy had an abstinence rate of ten percent at the end of treatment.

Compas and his colleagues then evaluated a smoking cessation treatment program performed by Stevens and Hollis (1989). The study included 744 adult smokers. All subjects were entered into an intensive four day/two hours per day smoking cessation program that consisted of cognitive and behavioral therapy. Also addressed were withdrawal symptoms, cognitive restructuring and relaxation techniques. Seventy-nine percent of the study population achieved smoking cessation at the end of the sessions. This group was then randomly assigned to three relapse prevention treatment. The first group received relapse prevention skills, the second group received group discussion, and the third group received no treatment. Abstinence rate at one year follow up was 41% among members of the relapse prevention skill group. The discussion group had an abstinence rate of thirty-four percent and the group that received no treatment had a rate of thirty-three percent. Compas and his associates concluded that a multicomponent therapy including cognitive and behavioral therapy in conjunction with nicotine replacement could increase rates of abstinence at and beyond the one-year period.

Supporting Compas and his colleagues' multicomponent program for smoking cessation was a study by Becona and Vazquez (1998). Becona and Vazquez evaluated 72 smokers who attended six one-hour sessions over six weeks that were led by two therapists who were experienced with smokers. The program was comprised of a multicomponent behavioral treatment program, which included a motivational contract signed by the participant, self-monitoring of smoking, information on nicotine, and smoking fading. Information pertaining to withdrawal symptoms and relapse strategies was also presented to the participants. At the end of treatment the abstinence rate was 75%, at a six-month post treatment the rate was 34.7%, at twelve-months the rate was 29.2%, at twenty-four months the rate was 25%, and at thirty-six months the rate was 23.6%. The researchers concluded that the multicomponent treatment program was effective in achieving abstinence at the one-year level and effective after one year for one-third of the participants in the study. Becona and Vazquez strongly recommended management efforts regarding relapse in addition to relapse prevention information.

Ouellette and Wood (1998) addressed interventions pertaining to risk-habits by considering factors that maintain routinized responses pertaining to the habit. Habits, such as smoking, are

prone to be repeated in the future, even if the habit is illogical in nature. Deliberate reasoning usually influences behavior that does not become habitual. Intention is important in regulating habit formation because intention reflects the underlying attitude of the behavior. Intentions can be in conflict with the habit and can thus deter individuals from forming a habit. The researchers noted that with ingrained habitual behavior, new intentions that are strong and motivating are needed to break the old intentions associated with the habit. The paradox of implementing this treatment is that smokers who wish to cease the habit may find that the conscious decision not to smoke requires them to concentrate more on the act of not smoking, thus increasing their concentration on the act of smoking.

Goldman and Glantz (1998) evaluated the effectiveness of anti-smoking messages and anti-smoking advertisements. The researchers found that the media was most effective when used in conjunction with community support groups, higher taxes on cigarette products, and smoking educational programs in schools. The researchers found that the most effective media advertisements were those that took an aggressive stance against the tobacco industry and those where the companies were directly identified instead of using vague pronouns to identify the tobacco industries. The messages conveyed to the focus groups by the advertisements were that the tobacco industries were deceitful, dishonest, and manipulative to try to obtain new customers and make them addicted, so the companies could make more money. The advertisements also exposed the tobacco industry knowledge of the psychological dynamics going on during adolescence; that youth were not really showing independence, but were being manipulated by the tobacco industry to buy cigarettes. Also emphasized in the anti-tobacco advertisements was the effect of second-hand smoke. This proved to be an effective deterrent to cigarette use, secondary to the advertisement showing that smoking endangers others; that those people who choose not to smoke or are exposed to smoking because of age (young children) are having their rights not to smoke impinged upon.

Wilson, Wallston, and King (1990) evaluated the association between smoking cessation, self-efficacy, motivation to quit, and contract framing on smoking reduction. The behavioral treatment applied to their subjects was contingency contracting, which involved the subjects' making a written agreement that specified the exact behavior to be performed in order to receive a specially selected reward. The wording in the behavioral contracts was varied by presenting it as a gain frame or a gain plus loss frame. The gain frame contract defined the positive consequences of reducing smoking, while the gain plus loss contract included an emphasis on the loss of the positive reward if smoking reduction was not obtained. The treatment program took place over a 12-month period. The participants consisted of 37 males and 33 females, all regular smokers. The individuals were randomly assigned to the contract conditions. Forty-two

participants completed the entire study. The results of the study indicated that the majority of smoking behavior change occurred between baseline and three months into the program, suggesting to the researchers optimal levels of self-efficacy and motivation of the participants. After three months these measures stabilized. For smokers with low motivation to quit, combined framing conditions resulted in their smoking significantly fewer cigarettes post treatment compared to similar participants who had the gains contract only. Smokers who were highly motivated to quit smoking did well with the gain contract when compared to those in the gain contract with low motivation.

Lewis, Piasecki, Fiore, Anderson, and Baker (1998) reported the results of a randomized, double blind placebo controlled study comparing three treatments: nicotine patch plus counseling, placebo patch plus counseling, and minimal care intervention. The objective was to assess if the nicotine patch plus counseling increased long term abstinence over placebo or minimal intervention programs, and to identify factors associated with long term cessation after the treatment was completed. The study involved 185 individuals and the participants were randomly assigned to one of the three treatment programs. After the initiation of the patch, a study nurse phoned the participants at 1, 3, 6, and 24 weeks to provide cognitive therapy counseling and motivational support to the individual. Patch compliance and smoking behavior was also evaluated at these times. At the end of the six month treatment program, rates of abstinence were 4.9% for the minimal intervention group, 6.5% for the placebo patch group, and 9.7% for the nicotine patch group. The study showed no significant differences in long term cessation rates.

Rosal, Ockene, Hurley, Kalan, and Hebert (1998) studied the efficacy of nicotine gum on patients who wanted to quit smoking. The Physician-Delivered Smoking Intervention Study consisted of 299 participants (42% male, 58% female). Participants were counseled and offered strategies on smoking cessation. Those participants willing to quit smoking were offered the nicotine gum. The results showed at the end of the study that there was no significant difference in the rate of abstinence between those who had accepted the gum (24%) and those who did not accept the gum (20%) at 6-month follow up. Ironically, what did have statistical significance for smoking cessation was the participation of a female physician in the trial. The researchers also found that longer and multiple attempts at smoking cessation were better predictors for cessation than desire and social support to quit.

Cinciripini, Lapitsky, Wallfisch, Mace Nezami, and Van Vuakis (1994) studied multicomponent behavioral therapy conjointly with scheduled smoking reduction. Scheduled smoking reduction was defined as a three week process with the participant gradually reducing their nicotine intake and thus easing withdrawal symptoms after the individual stopped smoking. In this treatment, the intake of nicotine is regulated by time as opposed to the individual urges or personal situations associated

with cigarette consumption. The results of the researchers' study showed a forty-four percent abstinence rate compared to an eighteen percent abstinence rate with a nonscheduled, reduced smoking group at one year follow up.

The current study was designed to assess the effectiveness of a home based individualized treatment method designed to reduce smoking among young and older adult college students. A scheduled smoking reduction treatment plan, as defined above, in combination with a multicomponent behavioral program (including coping with withdrawal symptoms and relapse prevention strategies) was used in helping smokers who volunteered for a smoking cessation program, drawn from a small, liberal arts undergraduate institution.

## Method

### Participants

Thirteen adults volunteered to participate in a three-week smoking cessation program, which was advertised throughout campus. The program was offered in an individualized, confidential format with a student-researcher meeting with participants at their convenience. The individual format was provided to accommodate the needs of those who were either unable or unwilling to attend programs offered at a counseling center in a campus building.

### Procedure

At the start of the program, an informed consent form was signed by each participant outlining the basis of the study. The participants then completed a survey on determinants of smoking, familial patterns, and feelings while smoking. A student researcher interviewed each participant to evaluate current smoking consumption and assess reasons the individuals wanted to quit.

The participants were given two brochures published by the American Cancer Society to read on their own as they felt necessary. The first pamphlet, entitled "Commit to Quit" (1998), discussed three questions for smokers to ask themselves as they prepare to quit smoking. The next pamphlet, entitled "Smart Move! A Stop Smoking Guide", outlined the positive benefits of quitting, former smoker success stories, and guides to staying clean.

A comprehensive plan to quite smoking developed by Glaxo Wellcome (1997) was handed out to the participants; this guide was prepared by Michael Fiore, MD, Director of the Center for Tobacco Research and Intervention at the University of Wisconsin Medical School. This packet consisted of strategies to quit smoking, ways to cope with withdrawal symptoms, cognitive reasoning skills helping one deal with smoking trigger situations, and a reward system. Participants were guided through the packet and asked to share some of this information; it was highly encouraged that participants later fill out this packet for self-motivation.

The American Lung Association's Quit Smoking Action Plan

(1998) was given to participants providing them with a plan to prepare for smoking cessation, nicotine replacement options, and information about possible prescription medications available to aid in smoking cessation. Also, this provided information pertaining to support groups available on smoking cessation. It was at this point that the participants were informed that they could phone the psychology student aiding them in their smoking cessation whenever they needed any extra support.

A list of common nicotine withdrawal symptoms and withdrawal symptom coping strategies (Morton, 1989) was given to the participants. These coping strategies were grouped into relaxation, distraction, rethinking, problem solving, self-support, and protection methods. Each section was discussed with the participants to help them determine those methods that they were most likely to use and to permit them to ask any questions regarding these strategies. Following this participants received a short list of the positive benefits one gains when one quits smoking.

A brief discussion of information gleaned from a review of the literature took place. Next, any questions about the material given out or facts stated by the researcher were answered.

A smoking-intake weekly monitoring chart was given to the participants to fill out for the first week of the program. On this log, they were asked to state the brand of cigarette consumed and length. In addition to this, participants were asked to write in the log each time they smoked, indicate the time of day, situation surrounding the smoking behavior, and number of cigarettes smoked within each situation.

Treatment

No reduction in the baseline amount of cigarettes smoked was to occur in the first three days at the start of the program. During a mid-week discussion between researcher and participant, participants were asked to begin scheduling their smoking for every four hours, beginning the fourth day of the first week.

At the end of the first week, another brief meeting was held between participant and researcher. The completed smoking log was collected, and the log for the second week was distributed. Smokers were again asked to limit smoking to every four to five hours, depending on their individual abilities. Another mid-week discussion ensued to monitor the participants' progress. During this meeting, they were guided to smoke every five hours and limit the number of cigarettes smoked each time (i.e., no more than two cigarettes every five hours).

A final brief meeting was held before the last week of the program. The participants were encouraged to continue cutting back on cigarette consumption and to extend the amount of time between smoking, until no cigarettes were consumed.

## TABLE1

| | | Mean | N | Std. Deviation |
|---|---|---|---|---|
| Pair 1 | BASE | 9.78 | 13 | 5.34 |
| | SS | 7.93 | 13 | 4.70 |
| Pair 2 | BASE | 9.78 | 13 | 5.34 |
| | RS | 5.97 | 13 | 4.87 |
| Pair 3 | SS | 7.93 | 13 | 4.70 |
| | RS | 5.97 | 13 | 4.87 |

## TABLE2

| | | Mean Change | Std. Deviation | t | df | p |
|---|---|---|---|---|---|---|
| Pair 1 | BASE - SS | 1.85 | 2.06 | 3.25 | 12 | .007 |
| Pair 2 | BASE - RS | 3.81 | 3.93 | 3.50 | 12 | .004 |
| Pair 3 | SS - RS | 1.96 | 3.34 | 2.12 | 12 | .056 |

### Results

A paired sample t-test was conducted to evaluate whether there was a significant difference between the number of cigarettes smoked on baseline, scheduled smoking, and reduced/scheduled smoking days. The results, as shown in Tables 1 and 2, indicate the mean number cigarettes smoked on baseline days (M=9.78, SD=5.34) was significantly higher than cigarettes

smoked on scheduled smoking days ($M$=7.93, $SD$=4.70), $t$ (12)=3.25, $p$=.007. Another paired samples $t$-test indicated that the mean number cigarettes smoked on baseline days ($M$=7.93, $SD$=5.34) was significantly higher than number smoked on reduced/scheduled days ($M$=5.97, $SD$=4.87), $t$ (12)=3.50, $p$=.004. Lastly, results from a paired samples $t$-test showed that the number smoked on scheduled smoking days ($M$=7.93, $SD$=4.70) was significantly higher than number smoked on reduced/scheduled days ($M$=5.97, $SD$=4.87), $t$ (12)=-2.12, $p$=.05).

## Discussion

Participants in this individualized scheduled smoking program experienced significant reductions in their smoking, both during the scheduled and reduced scheduled phases of the treatment. This type of cessation program appears to be a promising way of addressing the needs of young adult and adult smokers, many of whom are reluctant to participate in large, group-format, counseling-center based programs. Future extensions of this research should attempt to recruit larger numbers of participants, and include collection of one year follow up data in order to assess maintenance of treatment gains over time. This and other types of smoking cessation programs may be helpful in trying to address the problem of campus smoking.

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